



Course Specification Document

Title	Network Protocols
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Credits	3.5 ECTS
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Aims	This course aims to familiarize the student with the fundamental protocols used in networks and the services they provide. This is achieved by teaching the internal structure of each protocol, the service it offers, how to configure it, and how to verify its operation. This enables the student to pursue further studies in the field of network engineering.
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Intended learning outcomes

On successful completion of this course, the student will be able to:

- Understand the principles of wired and wireless local networks.
- Define, configure, and manage local networks (both wired and wireless), troubleshoot, and enhance performance.
- Be familiar with the performance of TCP/IP protocols.
- Grasp the Internet Control Message Protocol (ICMP), Dynamic Host Configuration Protocol (DHCP), and Internet Group Management Protocol (IGMP).
- Understand congestion control mechanisms and methods of regulation.
- Understand network layer protocols: IPv4, IPv6, and Mobile IP.
- Analyze Internet protocols and design transitions to new protocols.

Syllabus

- **Local Ethernet Network:** Ethernet Protocol, Standard Ethernet, Fast Ethernet, Gigabit Ethernet.
- **Wireless Local Networks:** Introduction, 802.11 Standard, Bluetooth Network.
- **Network Simulators NS2-NS3.**
- **Network Linking Devices and Virtual Local Networks:** Hub, Switch, Router, Virtual Local Networks (VLANs).
- **Network layer protocols:** IPv4 Protocol, ICMPv4 Protocol, Mobile IP Protocol, Internet Group Management Protocol (IGMP).
- **IPv6 Protocol:** IPv6 Addresses, IPv6 Protocol, ICMPv6 Protocol, Transition from IPv4 to IPv6.
- **Introduction to transport layer:** Transport Layer Services, Transport Layer Protocols.
- **Transport layer protocols:** UDP Protocol, TCP Protocol, SCTP Protocol.